



# Energy Balance

Model independent understanding is possible

- Solar Energy =  $1370 \text{ W/m}^2$

Albedo (reflection by cloud, ocean, ice and surface of continent) is about 30 % --- very poor data

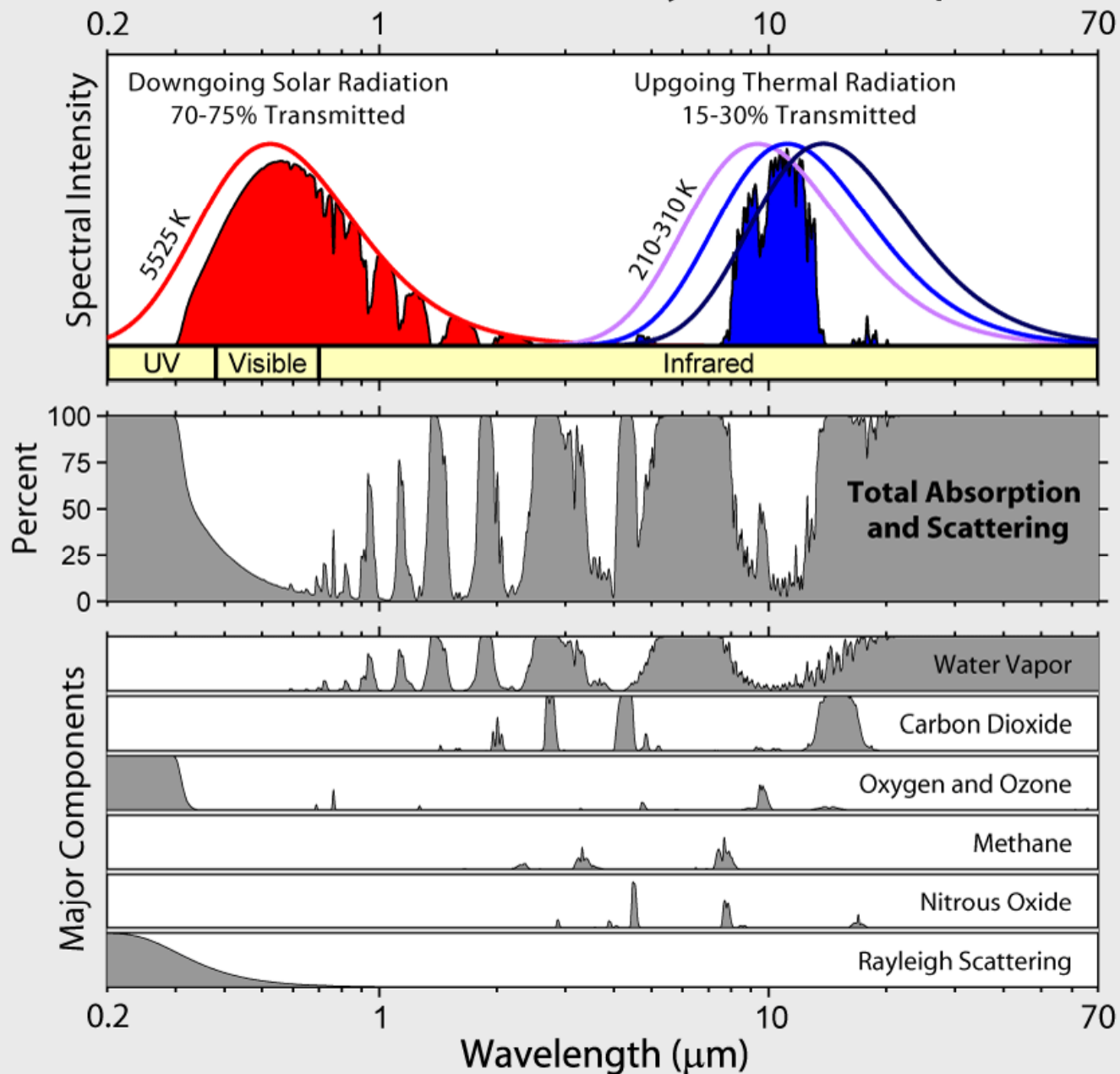
- Earth shine

Infrared region --- absorption by

$\text{H}_2\text{O}$ ,  $\text{CO}_2$ ,  $\text{CH}_3$ ,  $\text{NO}$  etc.

Very poor data --- GOSAT (Ibuki)

# Radiation Transmitted by the Atmosphere



# Possible Energy Sources to replace Fossil Fuel and their problems

- Nuclear Energy
  - nuclear waste, military usage(especially plutonium)
- Photovoltaic(Solar) Energy
  - cost
- Bio, Wind, Geothermal etc.
  - too small